THE PENNY MAGAZINE

OF THE

Society for the Diffusion of Useful Knowledge.

520.] PUBLISHED EVERY SATURDAY. [MAY 9, 1840.

THE NEWCASTLE IMPROVEMENTS.—No. VI.

[Continued from No. 519.]

[Grey Street, Newcastle.]

THE following is a summary of five years' work of Mr. Grainger, from August, 1834, to August, 1839.

The old property removed consisted of two theatres, the late butcher-market, Anderson Place (large mansion and offices), one large inn, eight public-houses, eighty private houses, and a great number of workshops and inferior buildings.

The site of the improvements cost .	£145,937
Workmen's wages and materials .	499,753
Total .	645,690

Out of this have arisen the following:—nine new streets (extending collectively one mile two hundred and eighty-nine yards), the new market, the central exchange, new theatre, new dispensary, music-hall, lecture-room, two chapels, incorporated company's hall, two auction marts, ten inns, twelve public-houses, forty private houses, and three hundred and twenty-five houses with shops.

Annual rental of occupied houses and shops	£17,416
When fully occupied, it will be . .	40,000
Value of the property	800,000

This, with former new erections, amounts to 995,000*l.* Thus nearly a million has been added to the value of the town by one man in five years, confining the estimate to the narrowest pecuniary consideration of the case.

The value of other property in the town has risen and is rising. The common complaint of the place is that there are no houses to be had. The other architects and builders of Newcastle have more to do, the more Mr. Grainger does. The importation of Baltic timber has become considerable. Two thousand workmen at a time have been employed by Mr. Grainger alone, and the presence of their prosperous families is, in every way, an advantage to the town, the population of which is at this time increasing at the rate of fifteen hundred a year. It would be thought on the Continent a great credit to a state to have done in the same period what we now witness at the hands of this charity-boy.

It will be seen that he is no less remarkable as a man of business than as an artist. No one supposes that he cares for money for its own sake; but he plainly shows that it is of great importance to him as the grand instrument of carrying out his designs, and that he chooses to neglect no fair means of obtaining it for this end. He has obtained 8000*l.* from the Newcastle and Carlisle Railway Company, in compensation for a disappointment about the situation of the terminus of their railway, which was to have been on his property at Elswick. In erecting his new streets he bethought himself of the lighting of the additional shops and public buildings, and required the Gas Company to enter into a contract with him; to which they agreed. This Company paid him nearly 25,000*l.* upon his guarantee that his tenants should obtain their gas-light, whether little or much, from the Company—a stipulation to which his tenants find no reason to object. He has sold a good deal of his Grey Street property, and has parted with more to the District Bank. The continual demand for houses makes him

more rather than less anxious to consult the good of all parties in peopling the new property. He now builds a house up to a certain point, and finishes it, to the convenience and taste of the tenant, after it is let. He thus does all he can to ensure the permanency of residence of his tenants.

The moral requisites to such achievements as Mr. Grainger's are no less remarkable than the intellectual. It is clear that he could not have effected what he has without having first inspired his neighbours with a strong confidence in his integrity. Gentlemen who have had to receive periodical payments from him declare him to be the most regular payer they ever had to do with. His workmen regard him as something like the sun for his punctuality and the unremitting character of his operations. They have occasionally tried him with strikes, but he has always been too much for them. We remember, on one of the first of these occasions, the excitement in the town at the news that Grainger's men had struck, and the curiosity to see what he would do. There he was in the midst of his stone and timber, as serene as a summer's morning, secure in his plans. Before the evening, he had sworn in six hundred apprentices. Being asked what he would do with so many novices, he answered that his excavations were just then his chief object, and the boys could excavate under his directions. So they did; the men offered themselves in crowds again presently. He picked and chose from among them—those whom he rejected being left at leisure to bewail their strike.

Much of his composure is doubtless owing to natural temperament; but there must also be some strong principle of self-control restraining the impetuosity on the one hand, and the anxiety on the other, to which enterprising minds are liable. It is said that Grainger was never seen out of temper; nor does his quiet cheerfulness ever appear to give way. When we consider how often his plans have certainly been thwarted—what noble designs he has been compelled to surrender—what opposition and disparagement he has encountered for years from such of his townsmen as have wrongly imagined that his interests were incompatible with theirs, and that in the conduct of such vast pecuniary affairs, through seasons of commercial fluctuation, a thousand difficulties and perils must have arisen—when too we take into the account the annoyances to which the master of two thousand workmen and the occasional servant of various public bodies must be subject day by day, it is clear that something far beyond common good-nature has been the means of bringing him through without injury to his health or peace of mind. We believe so from the facts that are seen and reported. He appears to be on the best terms with his brother architects—a fact honourable to him and to them. He is very popular among his men, finding leisure to consider their interests, and pleasure in extending his generosity to their families. Finally, while all the world knows what prodigious designs he hopes yet to work out, distancing even his past achievements, it is believed that he keeps his affairs arranged with such exactness to the smallest particulars, that in case of the most sudden death no one will suffer from the magnitude of his schemes, and that they may be carried on by some successor, if a worthy one can be found. These facts surely indicate that some deep principle of reliance lives and works within him, at once inspiring his genius and establishing his tranquillity of mind.

It may be asked whether no professional misfortunes have occurred in this wonderful career. We believe, only one of any importance. In the summer of 1836 the shells of three or four houses fell in while the workmen were employed upon them, and several lives (about eight, we believe) were lost. This accident has never been accounted for from any discoverable defect in the work; and as it is the only one, and there was no difference between the plan and execution of these houses and those of all the others in the same street, it is concluded by most people that the accident was caused by a thunderstorm which was at the moment passing over the town. There are not wanting persons who still predict, as they have done from the beginning, that accidents will happen, and who find fault, now with the foundations, and now with the superstructure of Grainger's works; but till such accidents do happen, the majority of observers are disposed, reasonably enough, to conclude that Grainger himself best understands the nature of the ground he builds upon, and is most interested in the security of his own property.

As for what remains to be done, a brief sketch of what is known of Mr. Grainger's intentions may fitly conclude our notices of him.

Mr. Grainger seems to have early thought that the energy and resources employed in other districts to extend manufactures might here be best used, at least in the first instance, in improving the convenience and beauty of the town, and in providing habitations for an increased population of the most valuable class. This done, and the results he anticipated being evident to all eyes, he now appears to contemplate raising the place in the rank of manufacturing districts. The great manufactures of the region are glass, alkali, and iron and brass founding. Mr. Grainger's aim seems now to be to afford a wide scope for these, while facilitating to the utmost the commerce of the port. He has purchased the great Elswick estate, lying along the river, west of the town. It consists of seven or eight hundred acres, and he paid 200,000*l.* for it. It contains natural wealth of various kinds, and among others extensive quarries of fine stone, and a spring of water, so pure and plentiful that he thinks of affording a new and superior supply of water to the whole town. His plan comprehends the junction of several railroads, the formation of extensive quays, the erection of ranges of manufactories, and on the high grounds behind, of villas and terraces. If he lives to complete his scheme, the inhabitants will see the Infirmary, now standing on a green eminence between the outskirts of the river, the centre of the town. A new bridge, so lofty as to permit shipping to pass under it, is projected by the Messrs. Green; and it is so much wanted, that it is easy to foresee that it will not continue a mere project. If this plan should meet with no serious impediment, and if Mr. Grainger lives to convert his Elswick estate to his own purposes, there is no anticipating what the town of Newcastle may become. If it should rise to the utmost conceivable magnitude and prosperity, no one will forget that it owed its main impulse and extension to Richard Grainger, the charity-boy.

EXTERNAL STIMULANTS

[Concluded from No. 519.]

Ammonia.—This alkali is much used as a counter-irritant. It is generally employed only as a rubefacient, that is, to produce a reddening of the skin; but with proper management it will blister. Let us consider a few of its preparations.

In France, an ammoniacal *pommade* is sometimes prescribed with advantage, as in the following case mentioned by Dr. Granville. A mason, having been picked up senseless after a fall from a scaffold, was carried to the *Hopital de la Pitié*. After a long treatment, he was discharged nearly cured; but in a few months epilepsy came on, and he was re-admitted. Dr. Serres, the eminent physician under whose care he was placed, believing the fits to arise from inflammation of the spine, prescribed local bleeding, which afforded some relief, but did not much diminish the number of fits. "At length a cerate was prepared, made by mixing caustic ammonia with purified butter of cacao, which, being spread on linen, was applied over and along the spine. By this means the

part became blistered in a short time, and was brought into a state of active surface-discharge, through which the paroxysms of epilepsy became less frequent and less important, until they at last ceased entirely." (Granville, p. 177.)

Preparations of hartshorn and oil are very frequently used. The liniment of ammonia of the London Pharmacopœia is composed of one part of solution of ammonia to two of olive oil; this is stronger than is requisite for a mere rubefacient, and in practice it is commonly diluted with a further portion of oil. The corresponding preparation of the French Codex (the *Liniment ammoniacal*, or *Liniment volatil*) has only one part of solution of ammonia to eight of oil. These embrocations are applied externally in cases of sore-throat, and will often relieve chronic rheumatism. The compound camphor liniment of the London Pharmacopœia is a very stimulating embrocation, being composed of seven parts and a half of solution of ammonia, with twenty of spirits of lavender, holding two and a half of camphor in solution.

But the strongest is one recommended by Dr. Granville in the work above quoted, where he omitted to give its composition, but afterwards published it in a medical journal. The Edinburgh College appear to have adopted it in the late edition of their Pharmacopœia, where we find the following formula:—

"Take of stronger Aqua Ammoniæ (D. 880), five fluid ounces;
Tincture of Camphor, two fluid ounces;
Spirit of Rosemary, one fluid ounce: mix them well together."

Ammoniacal liniments of such a strength as this will sometimes raise a blister in a few minutes, and, under good advice, are excellent applications in those critical cases where an instantaneous effect is a matter of imperious necessity. When this is wished for, linen soaked in the liniment is to be applied to the part, and evaporation is to be prevented by a bandage over the linen. This liniment applied to the back of the neck would, no doubt, often relieve head-aches; but so, indeed, will blisters, or tartar-emetic ointment. When head-aches arise from a foul stomach, languor, or fatigue, other remedies will be more appropriate; but when the cause is obscure, and irregular circulation within the brain may be suspected, the effect of this brisk counter-irritation is often most satisfactory.

Having thus discussed several external stimulants pretty fully, we will mention some others more briefly, lest our essay should swell to an inconvenient length.

Mustard is frequently used as a rubefacient. Besides redness of the skin, it sometimes excites vesication, and, when applied too long, has been known to cause gangrene. The volatile oil of mustard is far more active, and is used either pure, or mixed with equal parts of spirits of wine, according to the effect which it is wished to produce.

The mineral acids, particularly the sulphuric and the nitric, are violent caustics, and instantaneously corrode the skin; the former turning it brown, the latter orange-coloured.

Sir Benjamin Brodie, in his treatise on the diseases of the joints, recommends a liniment composed of one part of sulphuric acid to three of olive oil in inflammation of the synovial membranes of joints.

Creosote.—A substance discovered about seven years ago, and prepared from the oil of wood tar, is a powerful stimulant. An ointment made with one part of creosote to eight of lard has been used in one form, at least, of scalled head (porrigo scutulata).

Nitrate of silver (lunar caustic) is milder than caustic potash. Besides its use in substance as an application to warts and sores, it is used in solution as an eye-wash, in the proportion of two or more grains to the ounce of distilled water. One or two drops of this wash are put into the eye twice a day, in some of the slighter degrees of inflammation, and often with a good effect.

Oil of Turpentine (commonly called spirits of turpentine) is a stimulant of some note. The turpentine liniment, composed of soft-soap, camphor, and oil of turpentine, is used as a stimulating application to burns, according to the plan of Dr. Kentish.

If we wish for a milder stimulant than any we have yet mentioned, there is the *soap-liniment* of the London Pharmacopœia, made with three ounces of soap, one of camphor, and sixteen of spirit of rosemary. This is a useful application in chronic rheumatism, especially when aided by friction.

We will close our list, which might be indefinitely prolonged, by mentioning *acupuncturation*. This means the process of piercing the skin with needles, as a relief for nervous and rheumatic pains. It is a useful method of treatment, but does not happen to be much in fashion just at present. We have thus endeavoured to gratify a liberal curiosity by giving the names and uses of some of the principal remedies which are employed externally as stimulants; and it can hardly be necessary to caution the uninstructed reader to refrain from using them without proper advice. Many of them, if incautiously applied, would cause ulceration or even gangrene; and if swallowed, as too often has been the case from the carelessness of attendants or the insufficiency of labels, would be poisons.

Yet there are occasions where the layman is obliged to act as if skilled in surgery; for instance, the commander of a vessel which carries no surgeon; and it is then desirable to know what external stimulants he may include in his medicine chest, with the smallest chance of mischief. We should be inclined to recommend small blisters ready spread and cut into sizes by the druggist; a few ounces of tartar-emetic ointment; and a pint or two of soap-liniment. Take care, we would add, not to use these stimulants during the fever; discontinue the frictions with the ointment when the first pustules appear, and wash off what remains on the skin; and lest it should be mistaken for spermaceti ointment, let it be coloured with a little rose pink.

With such precautions these remedies will seldom do harm, and often, it is to be hoped, good; yet the cleverest shipman must not expect that the study of half an hour shall be equivalent to the experience of years.

Sagacity of the Horse.—The late General Pater, of the East India service, was a remarkably fat man. While stationed at Madras, he purchased a charger, which, after a short trial, all at once betook himself to a trick of lying down whenever he prepared to get upon his back. Every expedient was tried without success to cure him of the trick, and the laugh was so much indulged against the general's corpulency, that he found it convenient to dispose of his horse to a young officer quitting the settlement for a distant station up the country. Upwards of two years had subsequently elapsed, when, in the execution of his official duties, General Pater left Madras to inspect one of the frontier cantonments. He travelled, as is the usual custom in India, in his palankeen (a covered couch carried on men's shoulders). The morning after his arrival at the station, the troops were drawn out; and, as he had brought no horses, it was proper to provide for his being suitably mounted, though it was not very easy to find a charger equal to his weight. At length an officer resigned to him a powerful horse for the occasion, which was brought out, duly caparisoned, in front of the line. The general came forth from his tent, and proceeded to mount; but the instant the horse saw him advance, he flung himself flat upon the sand, and neither blows nor entreaties could induce him to rise. It was the general's old charger, who, from the moment of quitting his service, had never once practised the artifice until this second meeting. The general, who was an exceedingly good-humoured man, joined heartily in the universal shout that ran through the whole line on witnessing this ludicrous affair.—*The Plain Englishman.*

HORSE ARMOURY IN THE TOWER.—VII. Henry VIII.

[Continued from No. 819.]

[Henry VIII.]

Besides the splendid suit of armour made for Henry by command of the Emperor Maximilian, the Tower possesses another of the same date, exhibiting the more common costume of the knights of the time. This is represented in the above engraving, and will be found to be sufficiently described in the account of the military costume of this reign, given in our last paper. It is a suit of plate-armour, gilt, and much ornamented; and is known to have been in the possession of the monarch under whose name it is placed in the collection. The figure holds in its hand a *martel de fer*, and carries a fluted sword at the right side.

Perhaps at no time was the fashion of armour so chaste as at the period of which we are now treating. Each piece is adapted to the form of the body, and while the whole is sufficiently strong for every purpose of defence, the engraving and ornaments with which it is adorned give it an appearance of lightness and elegance which is not injured by any grotesque or uncouth adjuncts, such as disfigure the armour of preceding times. But the reign of Henry was characterised by considerable refinement in matters of this nature, and jousts and tournays, masques, fetes, and pageants became not only of frequent occurrence, but were conducted with the utmost magnificence and display, while knighthood appeared to gain new lustre from the gallant and chivalric conduct of the nobles of Henry's court. Every occasion of public rejoicing was eagerly seized as a pretext for soliciting the king's sanction to some joust or tournament; and if no such pretext offered itself, the king's licence was requested for the pleasure of the ladies and the gentle exercise of chivalrie.

The disposition of the king when young—gay, gallant, open, and liberal—rendered him partial to such amusements, and his pride and love of display induced him to render them as imposing as rich dresses and bright armour, and silks and cloth of gold, would admit of. Throughout his reign, and even when his general character altered so as to deserve the censure which all historians have bestowed upon him for his violence, cruelty, arrogance, bigotry, &c., he was still the patron of all knightly sports, and often partook himself of the exercise and of the honour attendant on the tournaments held at his court.

Although, as we have said, every occasion of public festivity was eagerly made the pretext for the "exercise of feats of arms," it appears to have been usually the practice to celebrate the month of May, in particular, by some such exhibitions. Several jousts are recorded to have been held at Greenwich in this month during the reign of Henry VIII., and in one of the articles prescribed for the regulation of a "passage of arms" held for such a purpose (which articles are preserved in an old MS. in the British Museum), it is directed that "a green tree shall be set up in the lawne at Greenwiche Parke the xxiiᵈ. daye of Maie, whereupon shall hang by a green lace a white shield" on which knights of good birth are invited to subscribe their names in answer to certain challengers who then proposed taking the field "against all comers." At one of these May sports the king himself, accompanied by the Duke of Suffolk, the Earl of Essex, and Sir George Carew, is recorded to have challenged all comers to joust and to tilt at the barriers. This was on the 20th of May, in the 8th year of the king's reign.

It was occasionally the practice of knights, when challenging others to the lists, to adopt fictitious names or characters, and an instance of this occurred in the second

year of the reign of Henry, when the birth of Prince Edward was celebrated by great feastings and sports. On this occasion four knights, calling themselves "Loyal Heart," "Valiant Desire," "Good Valour," and "Merry Thought," challenged all comers to the Tilt, Joust, and Tourney; and from the names of those who accepted the challenge (preserved in the MS. before alluded to), which included the highest and most noble knights of the court, we should conceive the exhibition to have been one of great magnificence. No less than twenty noblemen answered the challenge of this quadruple alliance.

An application to the king for leave to erect lists for the exercise of arms in honour of the month of May, which appears to have been personified by the speaker, some comely youth or close-shaved gentleman, and which speech has been preserved from oblivion by having been hidden in the pages of a musty MS. from the date of its delivery, abounds with so much quaintness that we cannot resist the temptation of extracting the whole speech, which was probably delivered in one of those masques by which the lords and ladies of the court were so often entertained in the reign of Bluff King Hal.

"Most high and excellent Prince: I, which am called the Lady Maie, in all months of the yeare, to lustie hearts most pleasant, certify your highness howe that under signe and seal, fully authorised by the hand of my lady and souvereign Dame Somer, I have free licence, during the time of my short reign, to pass my time and a fortenight in the moneth of my sister June, as shall be to my comfort and most solace; and therefore I being thus at my free liberty, taking my leave from her and her lusty and courageous court all the months of March and April, for to view the maner of all the whole dominions of my said ladye, have sailed in the stouring seas in this shippe, apparelled and tackled after my judgment as to my nature is appropriate, and accompanied, for the surety of my person, with divers gentlemen and yeomen, apt and active to any exercise that shall of them be demanded. And whereas I am so fortunable to make my first arrival in this most famous streame of honnor—fountaine of all noblesse—and part most renowned, called the realme of England, I have availed my sailes, as it appeareth; and in token my mind is determined here to abide, I have cast out myne anchors, under the support of your gratious licence, to rest me and my said servants, which have been long travaile in the stormy season of March and Aprill, humbly beseeching your grace not to be miscontent that I so boldly have enterprised arrivale without your gracious licence afore obteyned. But in manner I was enforced so to do; as I came sailing along the coast, and heard newes to me not very pleasant, how that Winter, a great enemy of my lady's, not long ago was honoured in the month of February, by the reason of exercise of feates of arms, the fame of which is not hid in all the rest of the world; that hath raised in me haste to speed me hither; and with my coming my heart is somewhat rewyred, for I set in mind that noble courageous hearts are determined to have my Ladye Somer in exercise of chivalrie. And for to stirre them the sooner to the said feates, I, the Ladye Maie, humbly beseech your grace to licence my poor servants to exercise against all comers in ways of pleasure and pastime all such articles as hereafter enseweth; not doubting but, your gracious licence obtained, all gentle courageous heartes will do as great and greater honour unto me, the lustye Ladye Maie (comfort of all lustye heartes), as they did lately to the servant of the Ladye Winter, Dame Februarie."

Then is recited the articles of the justes to be held the "fowerteenth daie of Maie, at Grinwiche," and to be continued all that month and a fortnight in June, "the Sondayes excluded." There is no date to this; but from the names affixed to the articles, "Charles Brandon (D. of Suffolk), Richard Blunt, Giles Capell," &c., it must have taken place in the reign of Henry VIII.

We have not thought it necessary to allude to the 'Field of the Cloth of Gold' and other celebrated 'Passages of Arms' of this time, as these are well known; but before we conclude, we may mention that until the close of his life, Henry VIII. continued to take the greatest pleasure in all such "gentle exercise," and was himself a patron or spectator of most of the jousts and tilts which took place in his realm. In the thirty-second year of his reign, a magnificent display of the nature we have been describing took place at the Tilt-yard, Westminster, at which the king was present. On this occasion Sir John Dudley, Sir Thomas Seymour, Sir R. Cornwall, Sir Thomas Poynings, Sir George Carewe, and Sir Anthony Kingston, were the challengers; and it is recorded that they "kept open house, with all manner of feasting," from "Friday, the last day of April, till Friday, the 7th of May," at Durham Place, near the Strand, to which "resorted to dynner, supper, and banquetting, divers tymes, the king's majestie and the queene, with other his nobles and gentlemen."

DISCOVERY OF THE NORTH-WEST PASSAGE.

[In a previous number (No. 389) we gave an account of the efforts of Messrs. Simpson and Dease to discover the North-West Passage by a land journey. This object has now been effected in a second journey performed by the same enterprising gentlemen, and we subjoin the narrative of it in their own words.]

(Despatch received at the Hudson's Bay House.)

Fort Simpson, October 16, 1839.

Honourable Sirs,—We have the honour to report the completion of all the primary objects of the expedition, the entire fulfilment of Governor Simpson's original instructions, under which it has been our good fortune to act, and something more, though, as we plainly told your honours last winter, it was quite out of the question to think of reaching the Strait of the Fury and Hecla from the Coppermine River.

On the 22nd of June we descended that impetuous stream of the Bloody Fall, where we remained until the 28th. This interval was employed by Mr. Simpson in exploring Richardson's River, discovered in 1838, which discharges itself, as we then supposed, into the bottom of Back's Inlet, in latitude 67° 53′ 57″ north, longitude 115° 56′ west. A party of about thirty Esquimaux were encamped there, all of whom fled precipitately to the hills, except one family, whose tent was placed on an island in the stream. With these last a communication was opened, through our interpreter Ooligbuck; but the circle of their little lives being confined to the Beren's Isles and the borders of Richardson's River, they had no information to impart of any value.

On the 3rd of July the first slight opening occurred in the sea ice, of which we took instant advantage; but our first week's journey did not exceed twenty miles, and it was the 18th, after sad work, before we could attain Cape Barrow. From its rocky heights we beheld, with equal surprise and delight, the wide extent of Coronation Gulf partially open, whereas, long after the same date in 1838, the whole party might have crossed it on foot. At midnight on the 20th we landed at Cape Franklin, just one month earlier than Mr. Simpson's arrival there on his pedestrian journey of the year before. A violent easterly gale arrested our progress for the next four days; and on the 27th and 28th we encountered great peril in doubling Cape Alexander amidst very heavy driving ice.

From Cape Alexander, situated in lat. 68° 56′ N., long. 106° 40′ W., to another remarkable point in lat. 68° 32′ N., long. 98° 10′ W., the Arctic coast may be comprised in one spacious bay stretching as far south as lat. 67° 40′ before it turns off abruptly northward to the last-mentioned position. This vast sweep, of which but

an inconsiderable portion was seen by Mr. Simpson last year, is indented by an endless succession of minor bays, separated from one another by long, narrow, projecting points of land, enclosing an incalculable number of islands.

From this description it will be evident that our route was an extremely intricate one, and the duties of the survey most harassing; but whilst perplexed beyond measure in finding our way through these labyrinths, we derived great advantage from the protection afforded by the islands from the crushing force of the seaward ice; and the weather was generally clear. In fact, the most serious detention caused by ice on this part of the voyage was from the 1st to the 5th of August, on a point that jutted out beyond the insular chain.

White Bear Point, as it was called, lies in 68° 7′ 85″ N., 103° 6′ 45″ W., variation 54° 45′ E. These bays and masses of islands present a distinct succession of geological features, which can be best illustrated by our series of specimens of the rocks that compose this wild and barren coast. Vestiges of Esquimaux, and mostly old, were met with wherever we landed.

They appear to subsist in single families, or very small parties, and to travel inland for the deer hunt in the month of June, not returning to their sealing islands till the ice sets fast in October. A river, twice the size of the Coppermine, which falls into the sea in 68° 2′ N. lat., 104° 15′ W. long., is much resorted to by reindeer and musk-oxen in the summer season. Finding the coast, as already remarked, trending northerly from the bottom of the Great Bay, we expected nothing less than to be carried round Cape Felix of Captain James Ross, contrary to the conjecture hazarded by Mr. Simpson, in his narrative of last year's journey. On the evening of the 10th of August, however (at the point already given), we suddenly opened a straight running to the southward of east, where the rapid rush of the tide scarcely left a doubt of the existence of an open sea leading to the mouth of Back's Great Fish River. This strait is ten miles wide at either extremity, but contracts to three in the centre. Even that narrow channel is much encroached upon by high shingle islands, but there is deep water in the middle throughout. The 12th August was signalised by the most terrific thunder-storm we have ever witnessed in these regions. Next day it blew roughly from the westward, with a very dense cold fog, but we ran rapidly south-east, past Point Richardson and Point Ogle of Sir George Back, and continued on till the darkness of the night and the increasing gale drove us on shore beyond Point Pechell. The storm shifted to north-east, and lasted till the 16th, when we directed our course, with flags flying, to the Montreal Island. On its northern side our people, guided by Mackay, soon found a deposit made among the rocks, by some of Sir George Back's party, but, as Mackay seemed to think, without that officer's knowledge. It contained two bags of pemican, and a quantity of cocoa or chocolate, all perfectly rotten, besides an old japanned tin vasculum, and two or three other trivial articles, of which we took possession, as memorials of our having breakfasted on the identical spot where the tent of our gallant though less successful precursor stood, on his return from Point Ogle to the Great Fish River, that very day five years before. The arduous duty we had, in 1836, undertaken to perform, was thus fully accomplished; and the length and difficulty of the route back to the Coppermine would have amply justified our immediate return. We had all suffered more or less from the want of fuel and the deprivation of warm food; and the prospects grew more cheerless as the cold fall weather stole on apace. But having already ascertained the separation of Boothia from the American continent, on the western side of the Great Fish River, we determined not to desist till we had settled its relation thereto on the eastern side also. A fog, which had come on, dispersed towards evening, and unfolded a full view of the picturesque shores of the estuary. Far to the south, Victoria Headland stood forth so clearly defined that we instantly recognised it by Sir George Back's exquisite drawing. Cape Beaufort we almost seemed to touch, and with the telescope we were able to discover a continuous line of high land as far round as north-east, about two points more northerly than Cape Hay, the extreme eastern point seen by Sir George Back.

The traverse to the farthest visible land occupied six hours' unremitting labour at the oar, and the sun was rising on the 17th when we scaled the bluff and singularly-shaped rocky cape to which our course had been directed. It stands in lat. 68° 3′ 56″ N., long. 94° 35′ W. The azimuth compass, by Jones, settled exactly in the true meridian, agreed with others by the same maker placed on the ground.

From our proximity to the magnetic pole, the compass had latterly been of little or no use; but this was of the less consequence, as the astronomical observations were very frequent. The dip of the needle, which at Thunder Cove (12th August) was 89° 29′ 35″, had been decreased to 89° 16′ 40″ N. This bold promontory, where we lay wind-bound till the 19th, was named Cape Britannia, in remembrance of our glorious country. On the beetling rock that sheltered our encampment from the sea, and forms the most conspicuous object on all this part of the coast, we erected a conical pile of ponderous stones, 14 feet high, that, if not pulled down by the natives, may defy the rage of a thousand storms. In it was placed a sealed bottle containing a sketch of our proceedings, and possession was taken of our extensive discoveries in the name of Victoria the First, amidst the firing of guns and the enthusiastic cheers of the whole party.

On the 19th the gale shifted from north-east to east-south-east, and after crossing a fine bay, due east, with no small toil and danger, the coast bent away north-east, which enabled us to effect a run of 40 miles. Next day the wind resumed its former direction, and after pulling against it all the morning among the shoals and breakers, and gaining only three miles, we were obliged to take refuge in the mouth of a small river.

From a limestone ridge, about a league inland, we obtained a view of some very remote blue land in the north-east quarter, in all probability one of the southern promontories of Boothia.

Two considerable islands lay far in the offing, and others, high and distant, stretched from east to east-north-east. Our view of the low main shore was confined to five miles in an easterly direction, after which it appeared to turn off greatly to the right. We could, therefore, scarcely doubt our having arrived at that large gulf uniformly described by the Esquimaux as containing many islands, and with numerous indentations stretching down to the southward, till it approaches within 40 miles of Repulse and Wager Bays. The exploration of such a gulf, which was the main object of the Terror's ill-starred voyage, would necessarily demand the whole time and energies of another expedition, having a starting or retreating point much nearer to the scene of operation than Great Bear Lake, and it was quite evident to us that any further foolhardy perseverance could only lead to the loss of the great object already obtained, together with that of the whole party. We must here be allowed to express our admiration of Sir John Ross's extraordinary escape from this neighbourhood, after the protracted endurance of hardship unparalleled in Arctic story. The mouth of the stream which bounded the last career of our admirable little boats, and received their name, lies in lat. 68° 28′ 27″ N., long. 97° 3′ W., variation of the compass 16° 20′ W.

The strong wind that had forbidden our advance gave wings to our retreat. The same night (August 20) we landed once more at Cape Britannia, and next morning recrossed the inlet direct to Point Pechell with a heavy

sea. On the 22nd we explored a long narrow bay on the west side of Point Ogle, which extends to the 68th parallel of latitude. The north wind blew roughly, with sharp frost, and next day we got no farther than Point Richardson. Thence we crossed over, on the 24th, to what had from the continent appeared like two islands, but which we rightly conjectured to form part of the southern shore of Boothia, or, to speak with greater precision, of that land on which stands Cape Felix of Captain James Ross. This shore we had the satisfaction of tracing for about 60 miles, till it turned up to the north, in lat. 68° 41′ 16″ N., long. 98° 22′ W., only 57 miles from Ross's Pillar; the dip of the needle was 89° 28′ 45″ N., the magnetic pole bearing north-north-east, distant 90 miles. The variation, as shown by both the azimuth compass and the horizontal bar needle, was 45 degrees east. The objects seen on this coast are easily enumerated. A low uninteresting limestone tract, abounding nevertheless in reindeer, musk-oxen, and old native encampments. To the westward a good deal of ice appeared, and vast numbers of snow-geese passed high over-head in long triangular flights, bound for milder skies.

Whilst engaged in taking observations, our men constructed another durable memorial of our discoveries, which was saluted in the usual manner. Then recrossing the strait on the 25th, we resumed for some time our outward route, only keeping more along the seaward verge of the islands, so as to shape a straighter course.

The weather, from being threatening and unsettled, soon became unequivocally severe.

On the 29th of August a severe snow-storm began that lasted for seven days, during four of which we were fixed to a single spot by the violence of the north-west gales, while the frost was so keen that the pools among the rocks on which we lay became solid enough to bear up a man. A more moderate interval succeeded this fierce outbreak. Quitting the continent again at the large river already mentioned, we struck north-north-west for an extensive island 22 miles off, which we coasted (north-west) for 20 miles, and shortly before sunset on the 6th of September stood out from thence due north for the nearest point of Victoria Land, which proved equally distant.

We have never seen anything more brilliant than the phosphoric gleaming of the waves when darkness set in. The boats seemed to cleave a flood of molten silver, and the spray dashed from their bows before the fresh breeze, fell back like showers of diamonds into the deep. It was a cold night, and when we at last made the land, cliffs, faced with eternal ice, obliged us to run on for a couple of leagues before we could take the shore with safety. The coast of Victoria Land, which we explored for upwards of 150 miles, is incomparably the boldest we have met with in these seas. Often near the shore no bottom could be found with 35 fathoms of line, and the cerulean blue colour of the water everywhere indicated a profound depth. There are several noble bays, the largest of which, north-west of Cape Alexander, is 20 miles wide and equally deep, backed by snow-clad mountains. It attains to 69° 40′ north, the highest latitude of this voyage. At length we reached the extreme point seen by Mr. Simpson from Cape Franklin in 1838, where the coast of this large country begins again to bend northward of west, Cape Barrow being by computation south-south-west, distant 50 miles. On the 10th of September we crossed this magnificent strait, with a strong east-south-east or side wind, and a rough sea, in which our gallant boats, old and worn out as they were, acquitted themselves beyond our most sanguine hopes.

Our return from Cape Barrow was miserably retarded by furious north-west winds and severe stress of weather. Winter permanently set in on the 15th of September, and next day, to the undisguised joy of the whole party, we re-entered the Coppermine River, after by far the longest voyage ever performed in boats on the Polar Sea. Leaving one of our little craft, together with the remains of the pemican (which, through age and long exposure, was become quite mouldy), and various other articles, as a prize for the first Esquimaux who may visit the Bloody Fall, we ascended the river with our double crew in four days; abandoning our tents, and everything but absolute necessaries, we crossed the Barren Grounds up to the knees in snow, having unluckily left our snow-shoes on the coast, and safely reached St. Confidence at dusk on the 24th. The fisheries had failed sooner than ever, and we had good reason to congratulate ourselves on not being doomed to pass a third winter within the Arctic circle.

After settling with the Indians, liberally rewarding the most deserving, and supplying all with ammunition gratuitously, we took our departure on the evening of the 26th, in two inland batteaux—one belonging to the expedition, the other came from Fort Simpson sixteen days before our arrival.

Our passage of Great Bear Lake was most boisterous and inclement; in crossing the body of the lake, and other considerable traverses, our boats, with everything in them, and even the very clothes on our backs, became converted into shapeless masses and concentrations of ice. It was high time for us to escape from Great Bear Lake, for the temperature, which was at four degrees below zero when we landed at the head of the river on the evening of the 4th of October, fell ten degrees below it in the course of the night; and next day we descended the rapid stream in the very midst of the driving ice. On entering the Mackenzie, we experienced a temporary mitigation of this excessive cold; but we should most assuredly have stuck fast above Fort Norman, had not the northern gales again rose in their strength, and while they shattered and dispersed the rapidly forming ice, enabled us to stem the current under close-reefed sails. At noon, on the 14th of October, after forcing our way with no small risk through the torrent of ice poured out by the rivers of the mountains, we reached this place, and were cordially welcomed by our valuable friend Chief-trader M'Pherson, who had for some time given up all hopes of our arrival.

Most of our people are still afflicted with acute pains and swelling in the limbs, caused by the cold and exposure; and we are assured by Mr. M'Pherson that he has never known or heard of so rigorous a commencement of winter in Mackenzie's River. On the other hand, so fine a spring as 1839 seldom visits these frozen regions; and to this favouring circumstance, under Providence, ought our signal success to be partially ascribed.

Oct. 30.—The state of the ice at length enables us to despatch couriers to the Slave Lake. In the meantime, Governor Simpson's highly valued letter of 17th June, which unfortunately missed us in our way hither, has cast up overland.

We rejoice in having anticipated the Russian expedition, and secured to our country and the Company the indisputable honour of discovering the North-West Passage, which has been an object of search to all maritime nations for three centuries.

When our expedition was planned at Norway House in 1836, it was confidently expected that Sir George Back would have achieved the survey of the Gulf of Boothia with the Terror's boats, and that our meeting at the mouth of the Great Fish River would have left no blank in the geography of Northern America. That officer's failure, the exhaustion of our men and means, and the necessity of a new wintering ground, render a fresh expedition indispensable for the examination of the Gulf of Boothia, the circuit of which, to the strait of the Fury and Hecla, according to the Esquimaux accounts, cannot be less than 400 or 500 miles.

It only remains for us to recommend to your approba

tion the plan proposed by Mr. Simpson to perfect this interesting service, which, as he had no wish to avail himself of the leave of absence granted, he is prepared to follow up whenever the limited means required are placed at his disposal. We have the honour to be your most obedient humble servants,

Peter W. Dease.
Thomas Simpson.

To the Governor, Deputy Governor, and Committee of the Hudson's Bay Company, London

---

Vitality of Seeds.—Without admitting such doubtful cases as those of seeds preserved in mummies having germinated, there are many instances of seminal longevity about which there can be no doubt. Books contain an abundance of instances of plants having suddenly sprung up from the soil obtained from deep excavations, where the seeds must be supposed to have been buried for ages. Professor Henslow says, that in the fens of Cambridgeshire, after the surface has been drained and the soil ploughed, large crops of white and black mustard invariably appear. Miller mentions a case of Plantago Psyllium having sprung from the soil of an ancient ditch which was emptied at Chelsea, although the plant had never been seen there in the memory of man. De Candolle says, that M. Gerardin succeeded in raising kidney-beans from seeds at least a hundred years old, taken out of the herbarium of Tournefort; and I have myself raised raspberry plants from seeds found in an ancient coffin, in a barrow in Dorsetshire, which seeds, from the coins and other relics met with near them, may be estimated to have been sixteen or seventeen hundred years old.—*Dr. Lindley's Theory of Horticulture.*

Circumstances which determine Physical Climate.—The aspect of a country has an influence upon its climate, for this reason, that the angle at which the sun's rays strike the ground, and consequently the power of those rays in heating it, varies with the exposure of the soil relatively to that luminary. When the sun is elevated on the meridian 45° above the horizon, his rays fall perpendicularly on the side of a hill facing the south at an equal angle, while the plain below receives them at an angle of 45°. Supposing the north side of the hill to have a similar slope, the rays would run parallel to its surface; and their effect be very trifling, but if the declivity were still greater, the whole surface would be in the shade. This, though an extreme case, serves to show why temperature varies with the inclination of the earth's surface. Since the warmest part of the day is not when the sun is on the meridian, but, owing to the accumulation of the heat, two or three hours afterwards, it follows that, in our hemisphere, a south-south-west or south-western aspect is the warmest, and a north-north-east or north-eastern the coldest, if no local circumstances exist to make it otherwise. The effect of aspect is, of course, most strikingly seen in regions covered with high mountains. In the Valais in Switzerland, the Alps are on one side covered with ice, while vineyards and orchards flourish on the other. Mountains affect a climate in more ways than one. They attract the vapours in the atmosphere, and causing them to condense, give rise to those violent rains which are often experienced in the neighbourhood of lofty ranges. They also afford shelter from winds. In narrow valleys, the sides of which in summer strongly reflect the sun's rays, this shelter sometimes renders the heat very injurious. One reason why the central and southern parts of European Russia are exposed to greater cold than their latitude and inclination southward would lead us to expect, is the absence of any chain of mountains to protect them from the full influence of the winds blowing from the White Sea and the Ural Mountains. The inhospitable climate of Siberia arises from its descent towards the north, exposing it to the winds of the Frozen Ocean, while at the same time the vast mountainous chains that cross central Asia intercept the southern winds, whose access would tend to mitigate the rigour of the atmosphere. It is evident that the nature of the soil must very materially operate upon climate. One soil acquires heat, keeps its acquired heat much longer, or reflects it more readily than another. One which from its porous character allows the rain descending upon it to pass freely into the earth, will emit much fewer exhalations than one which retains the water near the surface. Thus clayey or marshy grounds lower the temperature, and, especially in hot and humid climates, affect the atmosphere in a manner pernicious to health; on the other hand, those which are light, stony, or calcareous, tend to make the atmosphere salubrious. The great cold and the unwholesome air that prevail in the Russian governments of Astracan and Orenburg, lying to the north of the Caspian Sea, are attributed partly to the saline nature of the soil; and it is well known that the arid tracts of sand in Africa and Arabia conduce not a little to the excess of heat under which those countries labour.—*Physical Geography, published under the Superintendence of the Society for the Diffusion of Useful Knowledge.*

Importance of Registration.—A faithful register of births, marriages, and deaths, is wished for by enlightened philanthropists of all advanced countries, far more as a test of national morals and the national welfare, than as a matter of the highest social convenience. For this the physiologist waits as the means of determining the physical condition of the nation; as a guide to him in suggesting and prescribing the methods by which the national health may be improved, and the average of life prolonged. For this the legislator waits as the means of determining the comparative proneness of the people to certain kinds of social offences, and the causes of that proneness; that the law may be framed so as to include (as all wise laws should include) the largest preventive influence with the greatest certainty of retribution. For this the philanthropist waits as a guide to him in forming his scheme of universal education; and without this,—without knowing how many need education altogether,—how many under one set of circumstances, and how many under another,—he can proceed only in darkness, or amidst the delusions of false lights. He is only perplexed by the partial knowledge, which is all that his utmost efforts enable him to obtain. If he goes into every house of every town and village in his district, he is no nearer to an understanding of the intellectual and moral condition of the nation than he was before: for other districts have a different soil and different occupations; the employments of the people, their diseases, and their resources, are unlike; and, under these diverse influences, their physical, and therefore moral and intellectual condition, must vary. The reports of philanthropic societies do little more for him, drawn up as they are with partial objects and under exclusive influences: parliamentary disclosures are of little more use. Vague statements about the increase of drunkenness, resistance to one kind of law or another, alarm and distress him; but such statements again are partial, and so often brought forward for a particular object, that they afford no safe guide to him who would form a general preventive or remedy. Thus it is under all partial methods of observation; but when the philanthropist shall gain access to a register of the national births, marriages, and deaths, he will have under his hand all the materials he requires, as completely as if he were hovering over the kingdom, comprehending all its districts in one view, and glancing at will into all its habitations. The comparative ages of the dead will indicate to him not only the amount of health, but the comparative force of various species of disease; and from the character of its diseases, and the amount of its health, much of the moral state of a people may be safely pronounced upon. The proportion of marriages to births and deaths is always an indication of the degree of comfort enjoyed, and of the consequent purity of morals; and, therefore, of the degree in which education is present or needed. A large number of children, and a large proportion of marriages, indicate physical and moral welfare, and therefore a comparative prevalence of education. A large number of births, and a small proportion of marriages, indicate the reverse. When these circumstances are taken in connexion with the prevailing occupations of the district to which they relate, the philanthropist has arrived at a sufficient certainty as to the means of education required, and the method in which they are to be applied.—*How to Observe: Morals and Manners, by Harriet Martineau.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

LONDON: CHARLES KNIGHT & CO., 22, LUDGATE STREET.
Printed by William Clowes and Sons, Stamford Street.